CLAIMS

I Claim

1. A method comprising:

delivering an arteriogenic factor to a vessel region in a medically effective manner to structurally enlarge an existing blood vessel.

2. The method of claim 1 wherein said delivery comprises providing said arteriogenic factor to said vessel region for a duration ranging from about one week to about five weeks.

3. The method of claim 1 further comprising providing a second delivery of said arteriogenic factor to said vessel region at about 3 to about 10 days after said delivering.

4. The method of claim 1 wherein said delivery comprises:

providing a syringe to accommodate said arteriogenic factor; and

advancing said arteriogenic chemical factor from said syringe to said vessel region.

5. The method of claim 1 wherein said delivery comprises:

providing a needle catheter to accommodate said arteriogenic factor; and

advancing said arteriogenic factor from said needle catheter to said vessel region.

6. The method of claim 1 wherein said delivery comprises:

providing a porous balloon catheter having a porous balloon to accommodate said arteriogenic factor; and

advancing said arteriogenic factor from said porous balloon to said vessel region via pores of said porous balloon.

7. The method of claim 1 wherein said arteriogenic factor is selected from a group consisting of an arteriogenic chemical factor, an arteriogenic physical factor, and an arteriogenic thermal factor.

8. The method of claim 7 wherein said arteriogenic physical factor is a needle catheter, said delivery comprising advancing a needle of said needle catheter to said vessel region, said needle to puncture said vessel region.

9. The method of claim 7 wherein said delivery comprises providing said arteriogenic chemical factor to said vessel region as part of a degradable microparticle.

10. The method of claim 7 wherein said arteriogenic thermal factor includes a catheter with a distal portion cooled to between about 0^{o} C and about 10^{o} C.

11. The method of claim 7 wherein said arteriogenic thermal factor includes a catheter with a distal portion heated to a range from about 40^{o} C to about 90^{o} C.

12. The method of claim 7 wherein said vessel region is a tissue of an extravascular vessel area, said arteriogenic chemical factor in an amount of between about 0.01 nanograms and about 1 mg per gram of said tissue.

13. The method of claim 7 wherein said vessel region is a tissue of an intramural vessel area, said arteriogenic chemical factor in an amount of between about 0.01 nanograms and about 1 mg per gram of said tissue.

14. The method of claim 1 wherein said vessel region is an intravascular vessel area including a flow of blood.

15. The method of claim 14 wherein said delivery comprises:

positioning said arteriogenic factor at a first portion of said vessel region; and

releasing said arteriogenic factor, said arteriogenic factor to reach a second portion of said vessel region via said flow of blood.

16. The method of claim 14 wherein said arteriogenic factor is an arteriogenic chemical factor in an amount between about 10 picograms and about 1 microgram per ml of said blood in said intravascular vessel area.

17. The method of claim 7 wherein said arteriogenic chemical factor is combined with a performance enhancing additive to promote enlargement of said existing blood vessel.

18. The method of claim 17 wherein said performance enhancing additive enhances stability of said arteriogenic chemical factor.

19. The method of claim 7 wherein said arteriogenic chemical factor is selected from a group consisting of an inflammatory, NG-nitro L-arginine methyl ester, asymmetric dimethyl arginine, Basic Fibroblast Growth Factor, and a gene construct.

20. The method of claim 19 wherein said inflammatory is selected from a group consisting of classic mediators, blood-borne molecules, cell bound molecules, endotoxins, and heavy metal compounds.

21. The method of claim 20 wherein said classic mediators are selected from a group consisting of histimine and bradykinin.

22. The method of claim 20 wherein said blood-borne molecules are selected from a group consisting of compliment factor 5A, Platelet Activating Factor, a prostaglandin, a leukotriene, a cytokine, and Monocyte Chemoattractant Protein.

23. The method of claim 20 wherein said cell bound molecules are selected from a group consisting of an intracellular adhesion molecule, a vascular cell adhesion molecule, a selectin, and a leukocyte integrin.

24. A method of structurally enlarging an existing blood vessel, said method comprising:

advancing a distal portion of a catheter to said existing blood vessel; and

delivering an arteriogenic factor in a medically effective manner to said existing blood vessel via said catheter.

25. The method of claim 24 wherein said arteriogenic factor is selected from a group consisting of an arteriogenic chemical factor, an arteriogenic physical factor, and an arteriogenic thermal factor.

26. The method of claim 24 wherein said existing blood vessel has been angiogenically induced.

27. An apparatus comprising:

an elongated catheter body; and

a distal portion of said elongated catheter body, said distal portion configured to deliver an arteriogenic factor to a vessel region in a medically effective manner to structurally enlarge an existing blood vessel.

28. The apparatus of claim 27 further comprising a catheter balloon at said distal portion.

29. The apparatus of claim 28 wherein said catheter balloon is equipped with pores for delivery of said arteriogenic factor.

30. The apparatus of claim 27 further comprising a needle at said distal portion.

31. The catheter of claim 30 wherein said needle is configured to puncture a vessel surface of said existing blood vessel when said distal portion is adjacent thereto.

32. The catheter of claim 30 wherein said needle is configured to release said arteriogenic factor from said distal portion to said vessel region.